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EXAMINER	
FAN, CHIEH M	

ART UNIT	PAPER NUMBER
2638	

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/974,921	YELLIN, DANIEL	
	Examiner	Art Unit	
	Chieh M. Fan	2638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: proper antecedent basis for the claimed "Gold and Hadamard code generator" in claims 11, 21, and 27.

Claim Objections

2. Claims 1-30 are objected to because of the following informalities:

Regarding claim 1, "the number of times" in line 4 should be changed to --- a number of times ---.

Regarding claim 2, "the number of times" in lines 1-2 should be changed to --- a number of times ---.

Regarding claim 4, "an exclusive OR gate" in line 2 should be changed to --- the exclusive OR gate --- since such limitation has been recited in claim 3, line 2.

Regarding claim 7, "a cross-correlation value" in lines 1-2 should be changed to --- the cross-correlation --- since such limitation has been recited in claim 6, line 2.

Regarding claim 8, "converting binary to a Binary phase shift keying" in lines 1-2 is not understood. Do you mean "converting a binary data to a Binary phase shift keying data"?

Regarding claim 9, "converting binary to a Quadrature phase shift keying" in lines 1-2 is not understood. Do you mean "converting a binary data to a Quadrature phase shift keying data"?

Regarding claim 11, it appears that "a channel code" in lines 1-2 should be changed to --- a spreading sequence ---.

Regarding claim 12, "the number of times" in line 4 should be changed to --- a number of times ---.

Regarding claim 13, "the number of times" in lines 1-2 should be changed to --- a number of times ---.

Regarding claim 14, "said generators" should be changed to --- the first and second spreading sequence generators ---.

Regarding claim 18, "a cross-correlation value" in line 2 should be changed to --- the cross-correlation --- since such limitation has been recited in claim 17, line 2.

Regarding claim 19, "converting binary to a Binary phase shift keying" in line 2 is not understood. Do you mean "converting a binary data to a Binary phase shift keying data"?

Regarding claim 20, "converting binary to a Quadrature phase shift keying" in line 2 is not understood. Do you mean "converting a binary data to a Quadrature phase shift keying data"?

Regarding claim 23, "the cross-correlation value" in lines 4-5 should be changed to --- a cross-correlation ---; and "the number of times" in line 7 should be changed to --- a number of times ---.

Regarding claim 28, "converting binary to a Binary phase shift keying" in line 2 is not understood. Do you mean "converting a binary data to a Binary phase shift keying data"?

Regarding claim 29, "converting binary to a Quadrature phase shift keying" in line 2 is not understood. Do you mean "converting a binary data to a Quadrature phase shift keying data"?

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 6, 12-15 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe (U.S. Patent No. 5,530,697).

Regarding claims 1-4 and 12-15, Watanabe teaches a CDMA system (see title) comprising an exclusive-OR gate (2 in Fig. 1) receiving a first spreading sequence and a second spreading sequence (col. 8, lines 1-6) and a counting means (3 in Fig. 1) for

counting the number of times the first and second spreading sequences are different (col. 8, lines 6-10). Note that since the number of times the two sequences are different is determined over a predetermined code length (col. 8, lines 9-10), the number of times the two sequences are the same is inherently also determined over the predetermined code Length.

Regarding claims 6 and 17, Watanabe also teaches determining a cross-correlation vale (6 in Fig. 1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 7-9 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (U.S. Patent No. 5,530,697) in view of Natali et al. (U.S. Patent No. 5,687,166, "Natali" hereinafter).

Regarding claims 7, 9, 18 and 20, Watanabe teaches the claims subject matter (see the rationale applied to claims 1 and 12 above), but does not specifically teach spreading sequence QPSK modulation. However, Natali teaches that it is well known that direct sequence spread spectrum CDMA system frequently use QPSK PN

modulation as in the IS-95 cellular telephone standard (col. 1, lines 32-36). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modulate the spreading sequence of Watanabe using QPSK modulation, so as to comply with the CDMA standard. Note that the spreading sequence is complex, i.e., having in-phase and quadrature components when the spreading sequence is QPSK modulated. Therefore, the claimed four cross-correlation terms (real-real, real-imaginary, imaginary-real, and imaginary-imaginary) is inherently required.

Regarding claims 8 and 19, Watanabe teaches BPSK modulation (col. 1, lines 54-56).

7. Claims 10, 11, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (U.S. Patent No. 5,530,697) in view of the admitted prior art.

Regarding claims 10 and 21, Watanabe teaches the claims subject matter (see the rationale applied to claims 1 and 12 above), but does not teach a Gold code generator to generate the spreading sequence. However, as admitted by the applicant, the spreading sequence in a CDMA system is a Gold sequence because the Gold sequence has good "noise like" properties yet is very simple to construct (page 1, lines 17-21). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a Gold code generator to generate the spreading sequence in the CDMA system of Watanabe because the Gold sequence has good "noise like" properties yet is very simple to construct.

Regarding claims 11 and 22, Watanabe teaches the claims subject matter (see the rationale applied to claims 1 and 12 above), but does not teach a Gold and Hadamard code generator to generate the spreading sequence. However, as admitted by the applicant that in the IS-95 standard, the spreading code in a CDMA system for each user is its Walsh code (also known as Walsh-Hadamard code) combined with the PN sequence (i.e., Gold sequence) of its base station (page 1, line 17 through page 2, line 4). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a Gold and Hadamard code generator to generate the spreading sequence in the CDMA system of Watanabe so as to comply with the IS-95 standard.

8. Claims 23-25 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler et al. (U.S. Patent No. 6,680,727, "Butler" hereinafter) in view of Watanabe (U.S. Patent No. 5,530,697) and Halliday (U.S. Patent No. 5,103,417).

Regarding claims 23-25 and 30, Butler teaches a CDMA apparatus (abstract, lines 1-2) comprising:

a pilot channel multiple access interference cancellation mechanism (title, abstract; col. 13, lines 13-14); and

a circuit to calculate a cross-correlation value between spreading sequences, said circuit including a pilot code generator and a channel code generator (col. 8, lines 21-23; col. 13, lines 54-61).

Butler does not particularly show the detail of the cross-correlation circuit. However, Watanabe teaches a cross-correlation circuit (Fig. 1) in a CDMA system (see title) comprising an exclusive-OR gate (2 in Fig. 1) receiving a first spreading sequence and a second spreading sequence (col. 8, lines 1-6) and a binary counter (3 in Fig. 1) for counting the number of times the first and second spreading sequences are different (col. 8, lines 6-10). Note that since the number of times the two sequences are different is determined over a predetermined code length (col. 8, lines 9-10), the number of times the two sequences are the same is inherently also determined over the predetermined code Length. Halliday teaches that a digital correlation apparatus using an exclusive-OR gate and a counter has an advantage of space and cost saving (col. 1, lines 13-26). Therefore it would have been obvious at the time the invention was made to incorporate the cross-correlation circuit of Watanabe including an exclusive-OR gate and a counter into the cross-correlation circuit of Butler for the advantage of space and cost saving.

Regarding claims 28 and 29, Butler further teaches BPSK and QPSK demodulation at the receiver (col. 13, lines 1-12). Therefore, it is inherent Butler teaches converting binary data to BPSK or QPSK data at the transmitter.

9. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler et al. (U.S. Patent No. 6,680,727, "Butler" hereinafter) in view of Watanabe (U.S. Patent No. 5,530,697) and Halliday (U.S. Patent No. 5,103,417), as applied to claim 23 above, and further in view of the admitted prior art.

Regarding claim 26, Butler in view of Watanabe and Halliday teach the claimed invention, as applied to claim 23 above, but do not teach a Gold code generator to generate the spreading sequence. However, as admitted by the applicant, the spreading sequence in a CDMA system is a Gold sequence because the Gold sequence has good "noise like" properties yet is very simple to construct (page 1, lines 17-21). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a Gold code generator to generate the spreading sequence in the CDMA system of Watanabe because the Gold sequence has good "noise like" properties yet is very simple to construct.

Regarding claim 27, Butler in view of Watanabe and Halliday teach the claimed invention, as applied to claim 23 above, but do not teach a Gold and Hadamard code generator to generate the spreading sequence. However, as admitted by the applicant that in the IS-95 standard, the spreading code in a CDMA system for each user is its Walsh code (also known as Walsh-Hadamard code) combined with the PN sequence (i.e., Gold sequence) of its base station (page 1, line 17 through page 2, line 4). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a Gold and Hadamard code generator to generate the spreading sequence in the CDMA system of Watanabe so as to comply with the IS-95 standard.

10. Claims 1-9, 12-20, 23-25 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler et al. (U.S. Patent No. 6,680,727, "Butler" hereinafter) in

view of Fletcher et al. (U.S. Patent No. 4,012,696, hereinafter "Fletcher") and Halliday (U.S. Patent No. 5,103,417).

Regarding claims 1-6, 12-17, 23-25 and 30, Butler teaches a CDMA apparatus (abstract, lines 1-2) comprising:

a pilot channel multiple access interference cancellation mechanism (title, abstract; col. 13, lines 13-14); and

a circuit to calculate a cross-correlation value between spreading sequences, said circuit including a pilot code generator and a channel code generator (col. 8, lines 21-23; col. 13, lines 54-61).

Butler does not particularly show the detail of the cross-correlation circuit. However, Fletcher teaches a cross-correlation circuit (Fig. 1) in comprising an exclusive-OR gate (2 in Fig. 1) receiving a first signal and a second signal (16 in Fig. 5) and an up-down counter (60 in Fig. 5) for counting the number of times the first and second signals are the same and the number of times the first and second signals are different (Note that since Fletcher' correlator has exactly the same structure as the instant application, Fletcher's correlator performs exactly the same functions as claimed. Further note that since a correlator is used to measure the similarity between two input signals, the nature of the input signals is irrelevant to the operation of the correlator. Whether the input signal is random or not will not change the operation of the exclusive-OR gate. Therefore, although Fletcher's correlator does not receive two spreading sequences, Fletcher's correlator may still be applied in the instant application.). Furthermore, Halliday teaches that a digital correlation apparatus using an

exclusive-OR gate and a counter has an advantage of space and cost saving (col. 1, lines 13-26). Therefore it would have been obvious at the time the invention was made to incorporate the cross-correlation circuit of Fletcher including an exclusive-OR gate and a up-down counter into the cross-correlation circuit of Butler for the advantage of space and cost saving.

Regarding claims 7 and 18, Butler teaches that the spreading sequence is complex, i.e., having in-phase and quadrature components. Therefore, the claimed four cross-correlation terms (real-real, real-imaginary, imaginary-real, and imaginary-imaginary) is inherently required.

Regarding claims 8, 9, 19, 20, 28 and 29, Butler further teaches BPSK and QPSK demodulation at the receiver (col. 13, lines 1-12). Therefore, it is inherent Butler teaches converting binary data to BPSK or QPSK data at the transmitter.

11. Claims 10, 11, 21, 22, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler et al. (U.S. Patent No. 6,680,727, "Butler" hereinafter) in view of Fletcher et al. (U.S. Patent No. 4,012,696, hereinafter "Fletcher") and Halliday (U.S. Patent No. 5,103,417), as applied to claims 1, 12 and 23 above, and further in view of the admitted prior art.

Regarding claims, 10, 21 and 26, Butler in view of Fletcher and Halliday teach the claimed invention, as applied to claims 1, 12 and 23 above, but do not teach a Gold code generator to generate the spreading sequence. However, as admitted by the applicant, the spreading sequence in a CDMA system is a Gold sequence because the

Gold sequence has good "noise like" properties yet is very simple to construct (page 1, lines 17-21). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a Gold code generator to generate the spreading sequence in the CDMA system of Watanabe because the Gold sequence has good "noise like" properties yet is very simple to construct.

Regarding claims, 11, 22 and 27, Butler in view of Fletcher and Halliday teach the claimed invention, as applied to claims 1, 12 and 23 above, but do not teach a Gold and Hadamard code generator to generate the spreading sequence. However, as admitted by the applicant that in the IS-95 standard, the spreading code in a CDMA system for each user is its Walsh code (also known as Walsh-Hadamard code) combined with the PN sequence (i.e., Gold sequence) of its base station (page 1, line 17 through page 2, line 4). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a Gold and Hadamard code generator to generate the spreading sequence in the CDMA system of Watanabe so as to comply with the IS-95 standard.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Horwitz et al. (U.S. Patent No. 4,601,047) see Figs 17 and 18.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M. Fan whose telephone number is (571) 272-3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chieh M Fan
Primary Examiner
Art Unit 2638

August 7, 2005